

### Beta Barium Borate - BaB<sub>2</sub>O<sub>4</sub>

#### Features

- Broad phase matchable range from 409.6nm to 3500nm
- Wide transmission region from 190nm to 3500nm
- Large effective second-harmonic-generation (SHG) coefficient about 6 time greater than that of KDP crystal
- High damage threshold
- High optical homogeneity with  $\delta n \approx 10^{-6}/\text{cm}$
- Wide temperature-bandwidth of about 55°C

#### Applications in tunable lasers

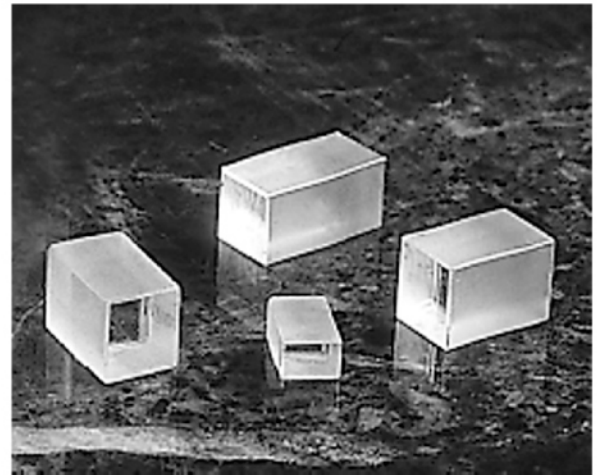
- Dye lasers
- Ultrafast pulse lasers
- Ti:Sapphire and Alexandrite lasers
- Argon Ion and Copper-Vapor lasers

#### Standard Specifications

Clear Aperture	central 90%
Flatness	$\leq \lambda / 8$ @ 633 nm
Surface Quality	10/5 (scratch/dig)
Parallelism	$\leq 20$ arc seconds
Perpendicularity	$\leq 5$ arc minutes
Angle Tolerance	$\leq 0.25^\circ$
Chamfer	$\leq 0.2$ mm @ $45^\circ$
Damage threshold (GW/cm <sup>2</sup> )	> 1 @ 1064 nm, TEM <sub>00</sub> , 10ns, 10Hz (polished only) > 0.5 @ 1064 nm, TEM <sub>00</sub> , 10ns, 10Hz (AR coated) > 0.3 @ 532 nm, TEM <sub>00</sub> , 10ns, 10Hz (AR coated)

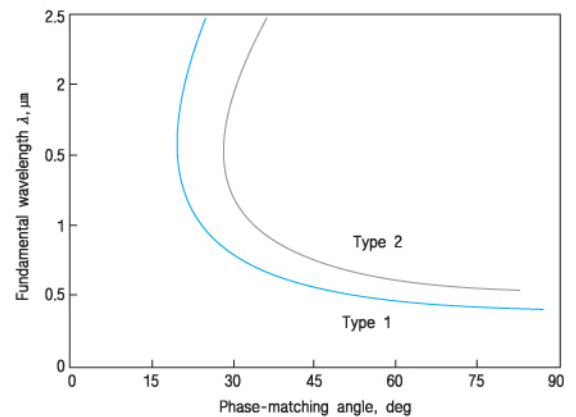
#### Physical and Optical Properties

Chemical Formula	BaB <sub>2</sub> O <sub>4</sub>
Crystal Structure	Trigonal, Space Group R3c
Optical Symmetry	Negative Uniaxial ( $n_o > n_e$ )
Melting Point	about 1095°C
Density	3.85 g/cm <sup>3</sup>
Mohs Hardness	4
Optical Homogeneity	$\delta n \approx 10^{-6}/\text{cm}^{-1}$
Transparency Region at "0" Transmittance Level	190 - 3500 nm
Sellmeier Equations ( $\lambda$ [ $\mu\text{m}$ ])	$n_o^2 = 2.7359 + 0.0188 / (\lambda^2 - 0.0182) - 0.0135 \lambda^2$ $n_e^2 = 2.3753 + 0.0122 / (\lambda^2 - 0.0167) - 0.0152 \lambda^2$
Phase Matching Range Type 1 SHG	409.6 - 3500 nm
Phase Matching Range Type 2 SHG	525 - 3500 nm
Resistivity	$> 10^{11}$ ohm-cm
Angular Acceptance	0.8 mrad-cm ( $\theta$ , Type I, 1064 SHG) 1.27 mrad-cm ( $\theta$ , Type II, 1064 SHG)
Walk-off Angle	2.7° (Type I 1064 SHG) 3.2° (Type II 1064 SHG)
Absorption Coefficients	< 0.1 %/cm at 1064 nm < 1 %/cm at 532 nm

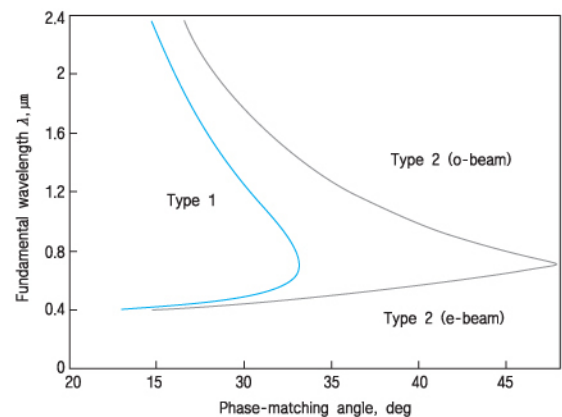


#### Offers

- Crystal size : up to 15 x 15 x 15mm<sup>3</sup>
- Crystal length : 0.02mm to 25mm
- AR, BBAR, P-coating



SHG tuning curve of BBO



OPO tuning curve of BBO at 355 nm pump